BUREAU of MATERIALS and RESEARCH

GEOTECHNICAL UNIT
GEOLOGY SECTION

BRIDGE FOUNDATION GEOLOGY REPORT

35-46 K-9014-01

Lone Elm Road over I-35
Br. No. 35-46-12.28(356) NB
35-46-12.26(355) SB

10-14-23E
SW SW

Johnson County

ROBERT W. HENTHORNE, P.G.
CHIEF GEOLOGIST

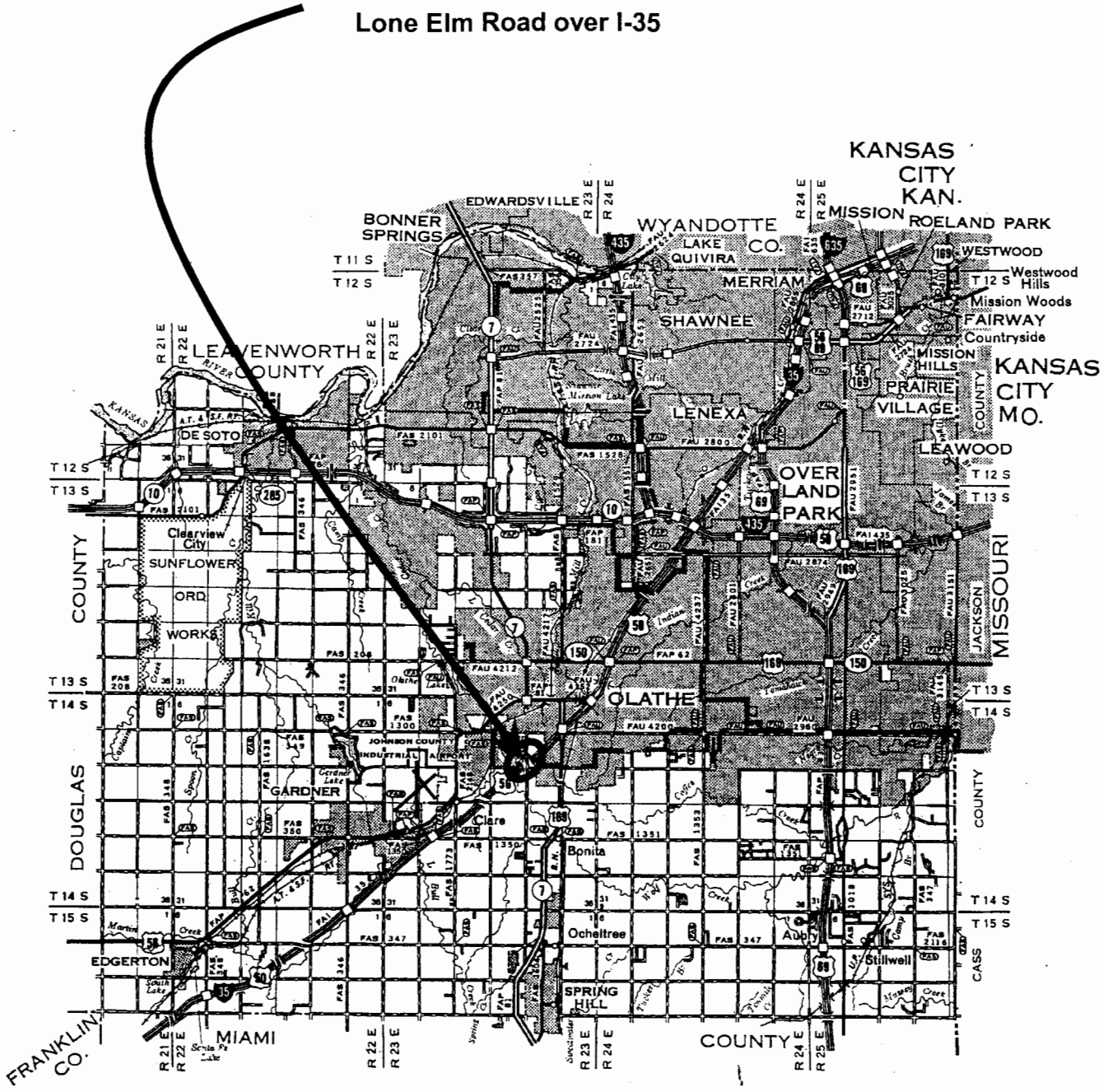
by

Randy Billinger, P.G., Regional Geologist
Jeff Geist, P.G., Geologist II
Carrie Denesha, Senior Engineering Geology Associate

February, 2005

35-46 K-9014-01

Lone Elm Road over I-35



Johnson County

KANSAS DEPARTMENT OF TRANSPORTATION

RTE./CO. I-35 / Johnson Co.	SOUNDING NO. CD 1	SHEET 1 OF 2
BRIDGE STA. 19+857.691	PROJ.NO. 35-46 K-9014-01	BRIDGE NO. 35-46-12.26 (XXX) S.B.
SITE NAME Lone Elm Road over I-35		HOLE STA. 19+897.26 m Lt
GEOLOGIST J Geist	SCALE 1:100 (10mm=1m)	DATE November 8, 2004
DRILLER B Bergman	RIG TYPE CME 75	TOP HOLE ELEV. 314.89
GW ELEV. ⊣ N/A	TOTAL DEPTH 11.73	M/B ELEV. 312.70

BIT TYPE	GEOLOGIC NAME	STRATIGRAPHIC COLUMN	DEPTH	ELEVATION	CLASSIFICATION OF MATERIALS DESCRIPTION AND REMARKS	UNCONFINED COMPRESSION	STANDARD PENETRATION TEST (SPT) N COUNT	STANDARD PENETRATION TEST (SPT) ELEVATION
				315	THE 314.89			
Hawthorne				314	Silty clay, brown			
			2.19	313	312.70 Interbedded limestone and shale. The shale is yellow-orange and gray, very weathered, limy throughout and sandy in the lower layer. The upper limestone is highly fractured and broken. The lower limestone is gray and hard with plentiful shell fossils and mostly, with little or no weathering.	36900		312.31
NQ2 Diamond	Rock Lake Shale Mbr	1	2.86	312	312.03 Limestone, light gray to orange-gray, weathered tan, mostly sandy at the top, becoming more shaly with depth. 311.51	32200		311.90
		2	3.38		Limestone, light gray to gray with some darker gray clayey shale seams. The limestone is wavy-bedded and highly fossiliferous.	17800		311.18
	Stoner Limestone Member	3		311				
		4		310		48400		309.87
				309		48700		308.79
				308				
			7.98	307	306.91			
	Eudora Shale Member	5			Shale, dark gray, clayey zones and limy zones. The clayey zones are somewhat expansive. It contains some fossil shells and an occasional pyrite nodule. The unit is competent. A distinct transition zone is present in the lower part of the shale. It contains interbedded thin limestone and shale.	2550		306.65
		6		306				
				305		14700		305.23
			10.90	304	303.99			
	Captain Creek Limestone Mbr	7	11.73		Limestone, light gray to tan-gray, medium-bedded with thin interbedded shale seams. 303.16	110000		303.58
				303				
				302				

LONE ELM ROAD OVER I-35

Core Hole 1
Sta. 19+897, 26 m Lt
T.H.E.
314.89

	314.89	0.00-2.19	Silty clay, brown
	312.70	2.19-2.29	Limestone, broken
	312.60	2.29	Begin Core
Core 1	312.60	0.00-0.11	Shale, dark orange-brown, very weathered and soft and clayey, limestone lenses
2.29-2.80			
Cut 0.51	312.49	0.11-0.42	Limestone, medium gray, hard, plentiful shell fossils
Rec 0.53	312.18	0.42-0.51	Shale, very sandy, yellow-orange and gray, weathered, few shells
RQD 26%			
	S1	*2.45-2.58*	*Limestone, gray, fossils*
Core 2	312.09	0.00-0.06	Shale, as above
2.80-4.33	312.03	0.06-0.27	Limestone, light gray – weathered tan, sandy, thin dark orange sandstone seam at base
Cut 1.53			
Rec 1.53	311.82	0.27-0.40	Limestone, more sandy, orange-gray, thin maroon sandstone seam at base
RQD 66%			
	311.69	0.40-0.51	Shale, very sandy and limy, light tan and orange
	311.58	0.51-0.55	Limestone, dark gray, very shaly
	311.54	0.55-0.58	Sandstone, orange-brown, very limy and shaly
	311.51	0.58-0.72	Limestone, light gray with dark gray, shaly seams
	311.37	0.72-0.74	Clay, brown
	311.35	0.74-1.28	Limestone, light gray
	310.81	1.28-1.31	Shale, gray, clayey
	310.78	1.31-1.53	Limestone, shaly, gray, wavy-bedded
	S2	*2.86-2.99*	*Sandstone, light gray and tan, limy*
	S3	*3.56-3.71*	*Limestone, light gray*
Core 3	310.56	0.00-1.52	Limestone, light gray with dark gray shaly seams, wavy-bedded, fossiliferous
4.33-5.85			
Cut 1.52			
Rec 1.53	*S4*	*4.83-5.02*	*Limestone, light gray, shaly*
RQD 78%			
Core 4	309.04	0.00-1.53	Limestone, light gray to gray, shaly seams, wavy-bedded, fossiliferous
5.85-7.38			
Cut 1.53			
Rec 1.51			
RQD 92%	*S5*	*5.91-6.10*	*Limestone, light gray, fossils*

Stoner LS Member

Core 5	307.51	0.00-0.60	Limestone, light gray with gray shaly seams, fossils
7.38-8.87	306.91	0.60-1.49	Shale, gray to dark gray, competent, non-limy
Cut 1.49			
Rec 1.44			
RQD 89%	*S6*	*8.08-8.24*	*Shale, gray*
Core 6	306.02	0.00-0.65	Shale, dark gray, slightly clayey, somewhat expansive,
8.87-10.39			competent, slightly limy, occasional pyrite nodule
Cut 1.52	305.37	0.65-0.82	Shale, dark gray, pulverized shell fragments
Rec 1.41	305.20	0.82-1.52	Shale, dark gray, slightly clayey, competent
RQD 84%			
	S7	*9.52-9.66*	*Shale, dark gray, shell fragments*
Core 7	304.50	0.00-0.36	Shale, dark gray, competent, more limy, few fossils at base
10.39-11.73	304.14	0.36-0.51	Shale and limestone transition zone, gray limestone,
Cut 1.34			dark gray shale, fossiliferous
Rec 1.38	303.99	0.51-1.34	Limestone, light gray and tan-gray, medium-bedded with
RQD 85%			shale breaks
	S8	*11.18-11.31*	*Limestone, tan-gray*

Total Depth 11.73 meters
Bottom Hole Elevation 303.16

KANSAS DEPARTMENT OF TRANSPORTATION

INFORMATION SHEET FOR SOIL SAMPLES

Submitted by J. Geist Address Abilene Geology Date 11/10/2004

Engineer in Charge A. Gisi, Geotechnical Engineer Sampled by Bergman

Project No. 35-46 K-9014-01, Lone Elm Rd over I-35 County Johnson

Construction Type Bridge Replacement Check whether: Active ____ Prelim X Research ____

SAMPLE NUMBER	STATION	DIST. ℄	DEPTH	TESTS REQUIRED	REMARKS
S1	19+897	26 m Lt	2.45-2.58	312.31 Unconfined Compression	LS, gray, fossils
S2	19+897	26 m Lt	2.86-2.99	311.90 Unconfined Compression	SS, lt gray and tan, limy
S3	19+897	26 m Lt	3.56-3.71	311.14 Unconfined Compression	LS, light gray
S4	19+897	26 m Lt	4.83-5.02	309.87 Unconfined Compression	LS, light gray, shaly
S5	19+897	26 m Lt	5.91-6.10	309.79 Unconfined Compression	LS, light gray, fossils
S6	19+897	26 m Lt	8.08-8.24	306.65 Unconfined Compression	SH, gray
S7	19+897	26 m Lt	9.52-9.66	305.23 Unconfined Compression	SH, dk gray, shell fragments
S8	19+897	26 m Lt	11.18-11.31	303.58 Unconfined Compression	LS, tan-gray

LABORATORY RECORD

Date received 11-10-04 Laboratory No. 04-5004-S

Remarks : THE 314.89

NOTE One copy of this form, completely filled out, must accompany each sample or group of samples submitted to the Materials & Research Center, 2300 Van Buren, Topeky, Kansas 66611.

Rev 2-84

DOT Form No 667

18-3

KANSAS DEPARTMENT OF TRANSPORTATION

RTE./CO. I-35 / Johnson Co.	SOUNDING NO. CD 1	SHEET 2 OF 2
BRIDGE STA. 19+857.691	PROJ. NO. 35-46 K-9014-01	BRIDGE NO. 35-46-12.26 (XXX) S.B.
SITE NAME Lone Elm Road over I-35		HOLE STA. 19+897.26 m Lt

BIT TYPE	GEOLOGIC NAME	STRATIGRAPHIC COLUMN	DEPTH	ELEVATION	CLASSIFICATION OF MATERIALS DESCRIPTION AND REMARKS	UNCONFINED COMPRESSION	STANDARD PENETRATION TEST (SPT)	
							N COUNT	ELEVATION

Core	Depth	Elev	Cut	Rec	%	RQD
1	2.29	312.60	0.51	0.53	104	26
2	2.80	312.09	1.53	1.53	100	66
3	4.33	310.56	1.52	1.53	101	78
4	5.85	309.04	1.53	1.51	99	92
5	7.38	307.51	1.49	1.44	97	89
6	8.87	306.02	1.52	1.41	93	84
7	10.39	304.50	1.34	1.38	103	85
Total	11.73	303.16	9.44	9.33	99	

Kansas Department of Transportation

Report of sample of geology cores

Laboratory N°. 04-5004
Date Reported: 11/18/2004
Date Received: 11/10/2004

Specification N°.	AASHTO T-208	Quantity:	8 cores
Source of Material	35-46 K-9014-01	County:	Johnson
Sampled from	35-46 K-9014-01		
Submitted by:	J. Geist		
Identification marks:	tags on samples		
Project or POV	35-46 K-9014-01		
Description of site:	Lone Elm Rd over I-35		
Type of Construction	Bridge replacement		

TEST RESULTS

ple N°.	Station	Offset (m)	Depth (m)	Description	Unconfined. Compression Qu (kPa)	Elastic Modulus E (kPa)	Dry Density γ_d (kg/m^3)	Moisture Percent W%
S-1	19+897	26M LT	2.45-2.58	LS,gray, fossils	36900	10900000	2650	0.8
S-2	"	"	2.86-2.99	SS, lt gray & tan, limey	32200	9300000	2610	1.0
S-3	"	"	3.56-3.71	LS, lt gray	17800	4380000	2347	6.3
S-4	"	"	4.83-5.02	LS, lt gray, shaley	48400	10000000	2621	0.9
S-5	"	"	5.91-6.10	LS, lt gray, fossils	48700	9420000	2569	2.1
S-6	"	"	8.08-8.24	SH, gray	2550	60100	2109	11.5
S-7	"	"	9.52-9.66	SH, dk gray, shell fragments	14700	1280000	1740	9.2
S-8	"	"	11.18-11.31	LS, tan-gray	110000	15700000	2611	1.6

T.H.E.= 314.89

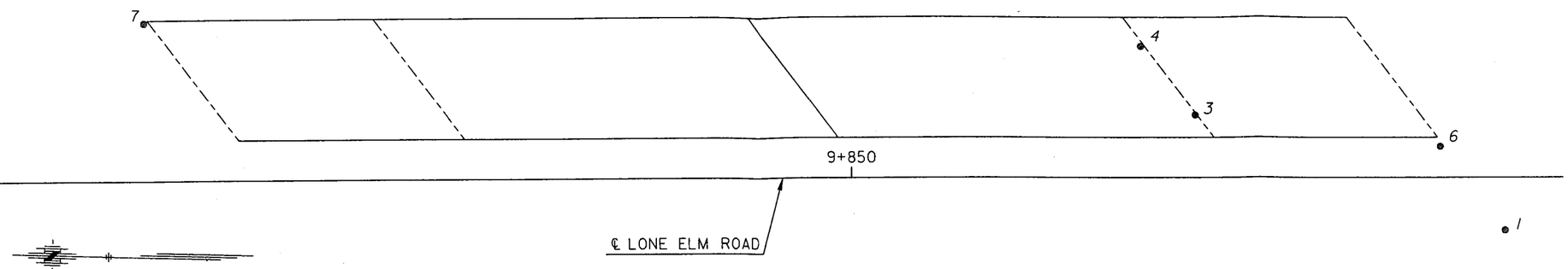
cc: L.S. Ingram
R. Fuller
R. Henthorne
N. Croxton
Soil Section
File 18-3

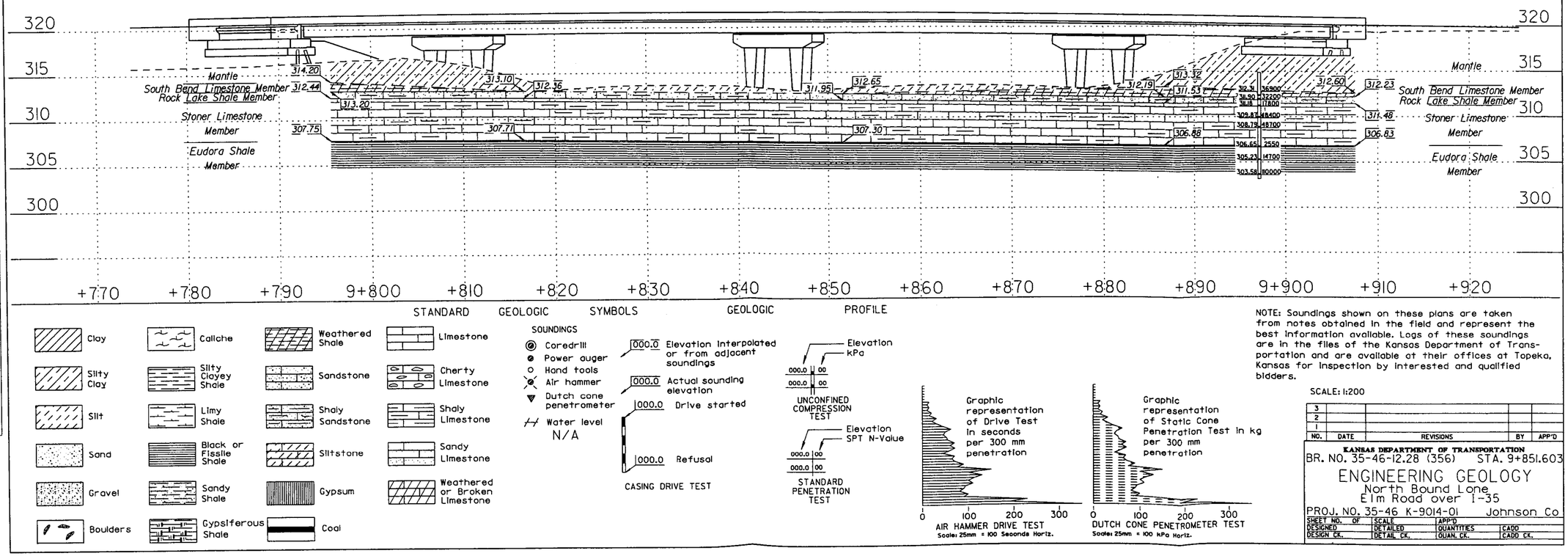
Reported by: _____

Title: Robert Fuller; Soils Engineer

FHWA REGION NO.	STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
7	KANSAS	35-46 K-9014-01			

1





STANDARD GEOLOGIC SYMBOLS

Clay
Silty Clay
Silt
Sand
Gravel
Boulders
Caliche
Silty Clayey Shale
Limy Shale
Black or Fissile Shale
Sandy Shale
Gypsiferous Shale
Weathered Shale
Sandstone
Shaly Sandstone
Siltstone
Gypsum
Coal
Limestone
Cherty Limestone
Shaly Limestone
Sandy Limestone
Weathered or Broken Limestone

SOUNDINGS

- Coredrill
- Power auger
- Hand tools
- Air hammer
- Dutch cone penetrometer
- Water level N/A

000.0 Elevation interpolated or from adjacent soundings
000.0 Actual sounding elevation
000.0 Drive started
000.0 Refusal
CASING DRIVE TEST

GEOLOGIC PROFILE

Elevation kPa
000.0 00
000.0 00
UNCONFINED COMPRESSION TEST

Elevation SPT N-Value
000.0 00
000.0 00
STANDARD PENETRATION TEST

AIR HAMMER DRIVE TEST
Scale: 25mm = 100 Seconds Horiz.

DUTCH CONE PENETROMETER TEST
Scale: 25mm = 100 kPa Horiz.

NOTE: Soundings shown on these plans are taken from notes obtained in the field and represent the best information available. Logs of these soundings are in the files of the Kansas Department of Transportation and are available at their offices at Topeka, Kansas for inspection by interested and qualified bidders.

SCALE: 1:200

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION
BR. NO. 35-46-12.28 (356) STA. 9+851.603

ENGINEERING GEOLOGY
North Bound Lone Elm Road over I-35

PROJ. NO. 35-46 K-9014-01 Johnson Co

SHEET NO. OF	SCALE	APP'D	
DESIGNED	DETAILED	QUANTITIES	CADD
DESIGN CK.	DETAIL CK.	QUAN. CK.	CADD CK.

Plotted By : $$USERNAME$$
Plot File : $$$$$$$$$$DGNSPEC$$$$$$$$$$$$$$$$
Plot Date : $$$$$$SYTIME$$$$$$
Std. Base File : Dansstn 2300 Van Buren Topeka 785-291-3861
Server File : working\k90140\geology\dgn\901412.dgn View= PLOT1
Server : projects on DNOmh71